Integrating e-learning system into university education

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Abstract:  
The implementation of information and communication technology (ICT) in to education is a complex task depending on the accessibility of technology, know-how of study materials design, systems of monitoring, evaluation, the legal and regulatory framework and other issues. Regarding these facts; e-learning is not exploited broadly and effectively enough in the university education today. One of the reasons is lack of the methodology for solving such a complex problem. There is a need for the systematic oriented approach. This article presents such systematic oriented approach of e-learning and its integration one the real application in the education at the University of Zilina.

1. Introduction

In general information and communication technology have brought fresh impetus to society, and education is not exception. They have brought and bring the possibility of new changes and these changes are called in education often e-learning. The meaning of this word is very often connected only with technology and its use in education is automatically assumed.

The liberal expression of Alan Kay quotation is: “New technology always bring the problem to us, but this in turn, is solved by the same new technology”. And ICT are the new technology for us and they the problem its bring we have to solved with them. [2]

Therefore the first problem, which ICT bring, has to be the educational problem. The technological problem is the second in this phase of ICT development. There are, of course other dimensions that have to be taken into account. Apart from the educational and technical problems there are also general economic and political situations, legal aspects as well as the attitude of the society towards the given changes. The above–mention aspects are relevant, but they also represent the challenge to be solved and overcome. They are not factors that will stop the incoming trend. The question can only be: How solved all this problems together?

And the answer is: To find out the systematic approach which solved all the problems together.

Traditional universities certainly stand in the forefront of change that will require consistent preparation and system-oriented solutions for e-learning implementation. This system oriented approach to the education at universities, and also to the lifetime education is valid and essential.

The general systematic approach for the e-learning implementation is not recommended. But there are many general system approaches in the literature. Therefore we have studied same systematic approaches and have created the own methodology of the e-learning implementation. We used this methodology as a basic tool by the implementation of e-learning at the University of Zilina and used it
in the project “Use of ICT and new generation platform in education”. Some experiences and important facts we describe below.

2. Starting point of e-learning

As a starting point the following documents were used:
- Documents of Higher Education

The Action Plan for eEurope activities brings the specific e-educational actions together in complementary e-learning initiatives. E-learning encompasses eEurope targets in an educationally oriented framework and addresses the request to adapt European education and training systems to the knowledge society. Base frameworks for development of higher education in the new educational environment are defined in many documents from meetings of university representatives and ministers responsible for education in Europe too. Such documents as Magna Charta Universitatum (1988), Bologna declaration (1999), Salamanca convention (2001), Prague summit of ministers (2001), etc. give key views about the future development of the university education.

Main conclusions from these meetings can be divided into four parts:
- the education policy and legislative,
- the philosophy and technology of education,
- the development of human and material resources,
- the content of education.

All the same ideas are recommended in the national documents in Slovakia.

The ideas of the above mentioned documents lead us to the consideration that the implementation of e-education has to be one of the main items of the global university strategy. The implementation of e-learning leads staff to new roles and unknown activities. To open up these new roles to university staff is very important and explains all the reasons why this strategic plan has been developed. Therefore our university management has developed a strategic plan, and offered it for general discussion. To open people up to these new roles, it is important to explain to all of them the reasons for this strategic plan. The management of the university created a discussion group via the university Intranet. There all questions linked to the new strategy of the university were discussed.

- The most frequent questions were:
  - Why was the strategy plan initiated?
  - What is intended by the term e-learning? What is behind this term?
  - How to integrate the e-learning system into high level education system?
  - What will the implementation of e-learning bring to as?
  - Why do the existing learning process have to be changed? They work well already… Is it really necessary?

The priorities and perspectives of students, teachers and administrative staff are different and it seems to be a never-ending story to find consensus. Assisting and
helping them to comprehend the complexity of the task removes short-term disillusionment.

3. Process view into education

New activities and processes are at the present facilitated by new information & communication services. These changes are the very complicated one, because in addition to technical and economical aspects, the solutions have to meet a socio-cultural aspect too. There are, of course, other dimensions that have to be taken into account.

“Changing the manner form in which interaction occurs calls for redesigning not only of the formal structures within the company, but also in the informal patterns of interaction between individuals and processes”, says G. C. Gourales (2000). [2]

The above-mentioned problems are relevant, on the other hand they represent the challenge to be solved and overcome. The transformation principles are the useful tool of changes. According to Andrews & Stalick (1997) [1] the transformation principles are divided into three layers, each of which has three components:

- A physical technical layer ensures the creation of a physical technical infrastructure through:
  - a process model,
  - a ICT infrastructure model,
  - an organizational model.

- An organizational and managing layer defines the requirements to ensure physical-technical infrastructure through:
  - management methods,
  - reward system,
  - measurement system.

- A value layer describes the basic philosophy and characteristics helpful for better understanding of changes through:
  - creation of organization culture,
  - political power,
  - individual belief systems.

Without the creation of transformation principles, the use of ICT in may not be accepted. This often leads to the ending of changes, which have been initiated, and brings a return to traditional ways of work. The fulfilment of these conditions helps to guarantee that a new process of realization by means of a new information & communication technology will be successful.

We have initiated process of changes with use of the general principle of transformation. The first step of changes was the design of an overall plan of the University for the implementation of e-learning based on two basic principles:

- the content and
- the form of education.

The first stepping-stone to the new education process was a redesigning of pedagogical documents such as university and faculties study plans and curricula. The second one was use information & communication technology in education as the provide an e-learning. There are still two form of education:

- the classical one, face to face,
Integrating e-learning system into university education

- the on-line, using e-learning system.

Which form will be used in which course is decided not only by the wish of the teacher. First of all, it depends on the character of the course, secondly it depends on the availability of supporting facilities. For example, discussion seminars, lectures or laboratory practices will remain in the same form, but ICT may support them using the videoconference, chat, discussion forum etc. It is necessary to weigh very carefully the ratio of these forms in each course.

The new process of the development of e-study material is increased. This new process of e-study material preparation is much more complicated than the process used today. As in the past, when text typing was a special profession, today multimedia course development should also be a special job and nobody should assume that this is the job of the teachers. The first moviemakers were scenario writers, producers, cameramen and directors all in one person, but today we have a movie industry and these are all special professions. It seems to us, that e-learning is the beginning of an education industry, and to achieve the same efficiency, new professions have to be created. Take the example of scenario writers in e-education. Course or module development is not a one-man job any more. Content providers have to participate in scenario writing; scenario writers have to participate in animation etc. The scenario writer has to know the possibilities of ICT too. There is no literature on how to write a good multimedia course scenario. There is no e-pedagogy or e-didactic which can help us. All available knowledge is at a research level. We have only limited experiences of multimedia course development. But if the multimedia course is good we have the experience, which allows the student to learn faster and better and with greater, a big motivation, especially if the testing is a part of it.

The value layer is very important too. It is necessary to develop the soft processes, such as the culture, beliefs and common goals at the university. These processes support e-learning creativity. Collective responsibility for the university’s success can be motivating even though the building of soft processes is a long-term never-ending task.

4. Technical system realisation

In the frame of the project „Use of ICT and new generation networks platform in education“ the technical system of e-learning was realized. It was not possible to implement all advances of e-learning immediately at whole university and effectively contribute to better education. Therefore, it was necessary to identify barriers and propose their overcoming. Then we were able to go on the realization of the technical system. The pilot project have been prepared at the Faculty of Management Science and Informatics [4] and after evaluation of the results was implemented at the whole university.

System analysis and design was used as the methodology of the e-education system creation. According to this methodology the first step was SWOT analysis of e-education. From the SWOT analysis we discovered the problem areas, which were solved by means of the expert’s questionnaire.

Four problem areas were specified:
- Teaching and Learning process,
- e-Study material development process,
Management of the education process,
Information and communication structure realisation.

268 teachers and 249 students from the various Slovak universities completed the questionnaire. After the questionnaire research there was the brainstorming of experts put into practice. The analyses outputs were the inputs for the realisation part of the e-learning system.

The realized e-learning system at the University of Zilina [3] is integrated system of electronic support for which proposal the system setting on a base of process models of the university was used.

Because of non-professional solution the integrated system e-education consist of five technical separated systems according to the sub-processes of the learning and teaching process:

1. System of summary of the subject information
2. Learning Management system
3. System for exam booking
4. System students grades recording
5. Course evaluation system

It is created in order to lead the teachers and students to the easiest use of electronic support in educational process. System access is provided by name and password, registration hints can be found at splash screen. The teachers have an access only into their subjects and students only into their registered subjects.

E-learning system at the University of Zilina is available at [3] [4] for all university students and teachers and is used in face-to-face as well as distance learning.

5. E-learning system as a tool of quality assurance

One of very important development areas at the present and in the future is the development and implementation of the quality management systems in education. Some education institutions do not put their attention on such areas of quality management enough. Present situation can be changed by ICT support of education and by designing and building up the processes of the quality management system. Quality management system design requires to determinate procedures and responsibilities for the realisation of educational process. Process performance measurement and management are therefore essential for achieving and maintaining the required quality.

There are two approaches how to implement quality system in education. The first is the implementation some of standard of quality and the second is to prepare the processes improvement and the measurement of the performance of the educational process or using the both approaches.

ISO 9000 and its versions are the well-known standards of quality and are used in the educational organisations too. Two of the faculties of the University of Zilina has ISO 9000 certificate. ISO 9000 has been often discussed for being inconvenient to use in some organizations, and for impact it might have on a corporate culture. According to one group of specialists in our university it is not appropriate to apply the process of quality management by ISO 9000 in organizations where high
potential of creativity of employees is required. They argue that processes technologies and customers’ demands are never-ending and therefore can be blocked by ISO 9000.

ISO 9000 is composed of many sections. The ISO 9004 part, which covers the area of improvement itself, is the most important one for creating of quality system in education. This part has been taken as the basis for creation of our system of quality supported by e-learning system.

The EFQM Excellence Model is one of the preferred quality frameworks in the educational field nowadays. University of Zilina is a member of the work team of the Leonardo da Vinci project SAETO - Self Assessment for Educational and Training Organisation, No. LI-05-B-F-PP-164510. The goal of this project is to developed a quality framework for self-assessment which is focussed on the vocational education and training organisation. The input will be the SAETO product based on the software support of the GOA – WorkBench that is licensed by EFQM.

The e-learning system at the University of Zilina makes it possible to define control points, which give information about the specified evaluation marks of learning and teaching process. They are possible three control points:

1. Study material
2. Knowledge evaluation
3. Evaluating of Students’ Satisfaction with Teaching

Study material

Publication of study materials and links to them in the e-education system enables a guarantee of the content of the study programs and the branches. The management of the university can evaluate the quality of study materials. The management of individual faculties specifies the competences of the evaluation. New approaches to the creation of study material together in e-education form are important as well as the technical devices and laboratory equipment. We assume that assessment of the education content is necessary if we want to be a part of the common European education area. The universities in the new European education area will obtain students not only by means of different courses of education, but by means of the educational approach and learning and teaching process, too.

Knowledge evaluation

Checking and evaluation are the main motivation factors, whatever the educational activity is. A student has to fulfil given tasks to a require standard, which is then checked on and evaluated according to given rules. The system of electronic support of education also provides an opportunity of knowledge check back. The objectivity of testing will be guaranteed by standardized tests, and an unambiguous computer evaluation system. The only thing a teacher will need to supervise is a student’s authenticity. Testing thus will not be restricted only to a “testing period”. Students will be able to test their knowledge in the course of a study term, and will therefore have enough time to improve themselves, if it is deemed necessary. A good and reliable testing system is also a source of motivation for students. It might change the student – teacher relation in a remarkable way. Until now, teachers have needed students to have somebody to teach, not to obtain the grade.
Evaluating of Students’ Satisfaction with Teaching

Another point of the evaluation of educational process will be an evaluation sheet of the subject, which the students will fill in after they have attended the lectures. The sheet will provide feedback for teachers, enabling them to improve the quality of education, as well as for the university management, providing them with an opportunity to check on the tuition. The electronic processing of the evaluation sheets is very simple. A problem might appear if, in spite of students’ demands, a teacher wants not willing to make a required change. For this situation, it is necessary to create appropriate evaluation and motivation mechanisms.

6. CONCLUSIONS

In many cases information & communication technologies are implemented into the old processes. Such implementations do not bring effects, which are needed for change of education and learning. It will be necessary to change university teaching and learning processes and initiate an overall discussion on evaluation criteria etc. Less visible but not a less threat is the possibility, that teachers will not accept e-learning implementation. Building up the political power and new organization culture is a long-term and never ending task, but it must be introduced, if universities want to be competitive in the new globalise education environment.

LITERATURE